Water Quality unit
EPA Region VIII

Monitoring and Assessment Programs

Monitoring and assessment programs provide the basic information on the condition of our Region's rivers, streams, lakes, reservoirs, and wetlands. Such **programs tell us whether waters support healthy fish and wildlife, are safe for swimming and fishing, or can be used for drinking and irrigation purposes**. There are many ways to monitor water conditions. To monitor constituents in water, sediment, or fish tissue - such as levels of dissolved oxygen, nutrients, metals, and pesticides - **chemical measurements** are taken. **Physical measures** - such as temperature, flow, and the condition of stream banks - are also important. **Biological measures** include the testing for pathogens, toxicity testing, and the abundance and variety of aquatic plants, periphyton, macroinvertebrates, and fish. The responsibility to monitor water quality rests with many different State, Federal, and local agencies. State pollution control agencies and Tribes have key monitoring responsibilities under the Clean Water Act and carry out extensive programs with support from EPA. Other major partners include city and county governments, State natural resource agencies, federal agencies such as the U.S. Geological Survey and U.S. Forest Service, and volunteers.

Why monitor? - Major purposes for monitoring include:

1. Determining water quality standards attainment (i.e., status and trends)
2. Identifying causes and sources of impairment;
3. Developing and revising water quality standards (e.g., nutrient criteria, biocriteria, site-specific criteria);
4. Establishing and implementing total daily maximum loads (TMDLs);
5. Evaluating the effectiveness of CWA and other programs (e.g., NPDES, 319, Superfund remediation); and
6. Responding to emergencies and problems such as drought, fires, floods, fish kills, and spills.

The Need - EPA summarizes water quality reports submitted by all 50 states into a biennial national report to Congress and the public called **The Quality of Our Nation's Water**. For 2000, States assessed 19% of the nation's total river and stream miles and 43% of the nation's lake and reservoir acres. Very small amounts of wetlands and ground water were assessed. States have not yet achieved comprehensive assessment, and EPA is working with States on ways to assess more waters given limited resources, through probabilistic monitoring designs, expanded indicators and tools, and improved collaboration and communication with other monitoring partners including federal agencies and volunteers. In addition to comprehensive assessment, State programs need to have the capacity to monitor for multiple measures and multiple uses.

Elements of a State Monitoring Program - Under 106(e)(1) of the CWA, each State establishes a monitoring program that includes methods and procedures necessary to compile and analyze data on the quality of waters. Each State's program should be documented using a monitoring and assessment strategy that addresses the following elements:

(1) Objectives
(2) Design of monitoring network(s)
(3) Indicators to measure WQS attainment
(4) Quality assurance plans and documentation
(5) Data analysis and assessment methodology
(6) Data management
(7) Reporting
(8) Program evaluation
(9) General support and infrastructure

EPA's Role in Monitoring and Assessment - Water Quality Unit staff work with States, Tribes and local entities to provide technical assistance as needed, particularly in the areas of monitoring strategies, monitoring designs, biocriteria, field methods, assessment methods, data management, and field support. Staff review and comment on State water quality reports, coordinate technical support for EPA's assessment databases, and assist with development of national guidance. The Unit also provides coordination and technical assistance to EPA projects and programs such as the National Lake Fish Tissue Study, Regional Environmental and Assessment Program (R-EMAP) projects and the EMAP Western Pilot. The Unit also supports development of Regional bioassessment and volunteer networks.

Program web sites include: http://www.epa.gov/owow/monitoring; http://www.epa.gov/ost/; http://www.epa.gov/region8/water/305b/305b.html; and http://www.epa.gov/region8/water/bio/bio.html.

Current Region VIII Priorities with Monitoring and Assessment:

- Assisting States with development of State monitoring strategies;
- Reviewing State assessment methodologies per EPA guidance;
- Improving data management for electronic data sharing and mapping;
- Assisting with development of new national guidance;
- Developing State biological assessment programs and Regional network for biocriteria, nutrient criteria, clean sediment methods, TMDL endpoints, and wetlands monitoring;
- Developing State and Tribal fisheries programs with focus on fish tissue contamination and invasive species; and
- Developing a Regional volunteer monitoring network.

Program Highlight - Biological Assessment

All of the Region VIII States are working on strengthening biological monitoring and assessment as part of their overall program. Multiple projects are underway, with EPA support, to collect, analyze and manage biological data for a variety of purposes. In addition to collecting biological data to assess aquatic life use support and support TMDL program needs, Colorado is developing methods to assess impacts from sedimentation. In South Dakota and Colorado, multiple agencies are working with an EPA grant recipient to develop a reference site network. Montana and North Dakota are leading efforts to develop wetlands biocriteria and nutrient criteria. Wyoming has developed preliminary biocriteria for streams. And Utah is one of the first States to enter their biological data into STORET.

EPA Region VIII is supporting the development of a fish index for Montana plains streams impacted by nutrients and introduced species and a macroinvertebrate index for Rocky Mountain streams impacted by metals via the R-EMAP program. GIS screening tools are being developed for the identification and evaluation of reference sites via EMAP. And EPA Region VIII is collaborating with Region X and Headquarters to support the development of a Western Bioassessment Center to assist with bioassessment issues of concern to the West.

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